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NASA TECH BRIEF

NASA Headquarters

Ultraviolet Interferometer

The problem:

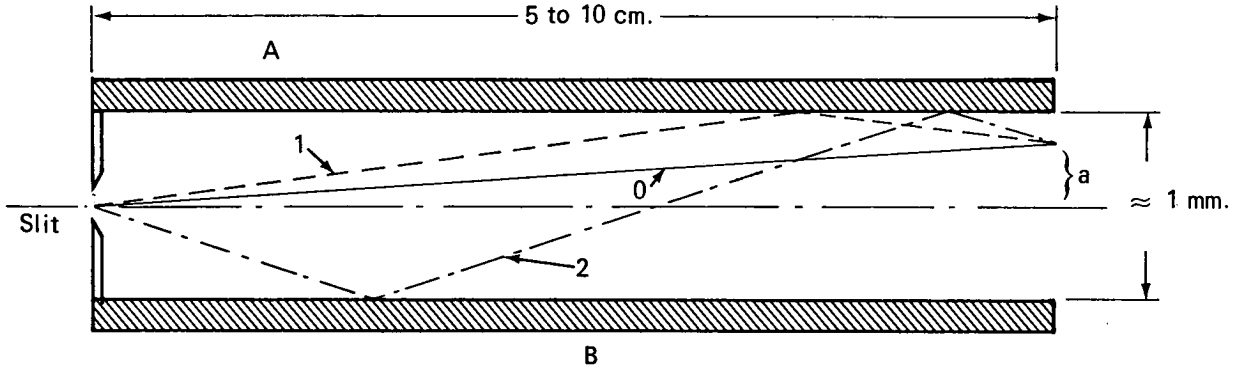
To obtain high resolution spectroscopic data from the ultraviolet region of the spectrum.

The solution:

A grazing-incidence multi-beam interferometer (GIMBI) which requires the use of neither concave diffraction gratings nor partially reflecting coatings, and produces an interference pattern whose fringes may be sharper than those produced by a Fabry-Perot interferometer.

How it's done:

The figure shows a simplified diagram of the GIMBI. A and B are two parallel planar mirrors with a length of about 5 to 10 cm and a separation of about 1 mm. The plates are illuminated through a slit or pinhole at the left. Rays following multiple transmission paths intersect at the exit plane to form an interference pattern. Three low-order rays are shown on the figure: "0" is the directly transmitted ray, and "1" and "2" are the rays which are reflected once and twice respectively, with the final reflection from surface A. A similar set of rays, "−1", "−2", etc., undergo final reflection from surface B. The resultant total intensity produced by the interference of these rays at a general distance "a" from the centerline is strongly dependent on wavelength.



The GIMBI eliminates many of the most critical problems associated with existing ultraviolet interferometers: it does not require materials transparent to ultraviolet wavelengths, and the predominant reflections take place at a low angle of incidence, thus ensuring high reflectivity.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Headquarters
National Aeronautics
and Space Administration
Washington, D. C. 20546
Reference: TSP71-10026

(continued overleaf)

Patent status:

No patent action is contemplated by NASA.

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